

BRIDGED POLYSESQUIOXANE HOST MATRICES CONTAINING  
LANTHANIDES CHELATED BY ORGANIC GUEST LIGANDS,  
AND METHODS OF MAKING SUCH MATRICES

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Abstract

Bridged polysesquioxane compositions comprising: a bridged polysesquioxane host matrix comprising sesquioxane moieties and organic moieties, the sesquioxane moieties comprising a metallic element, the organic moieties interposed between sesquioxane moieties; and a guest molecule comprising a lanthanide atom; at least some of the organic moieties comprising a substituent selected from the group consisting of electron withdrawing functional groups and electron donating functional groups. Processes for making such bridged polysesquioxane compositions. Gain media and active materials for upconversion lasers comprising such bridged polysesquioxane compositions. Light can be amplified by fluorescence emissions from the bridged polysesquioxane compositions.